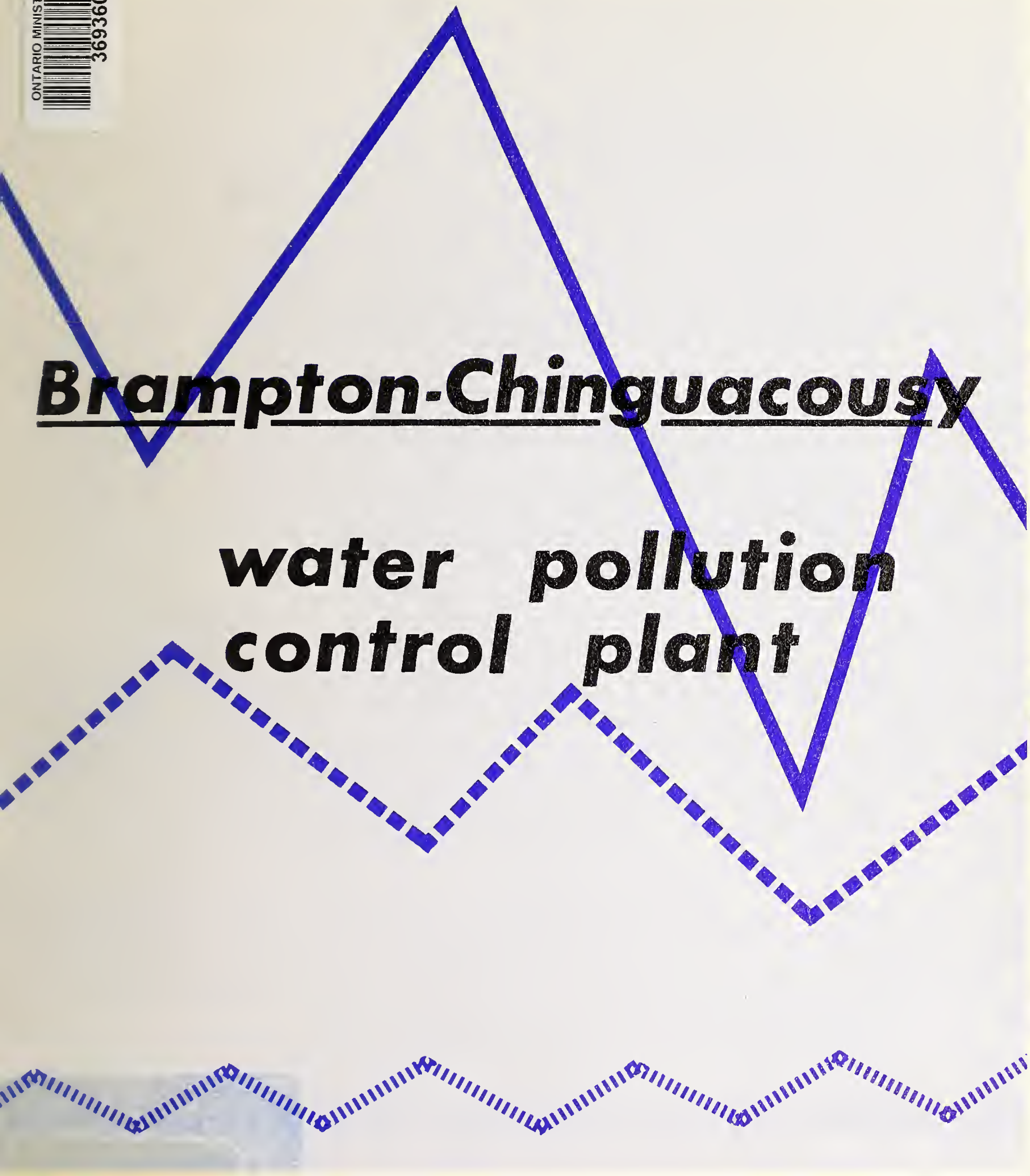
ONTARIO MINISTRY OF ENVIRONMENT
36936000020968

OPERATING SUMMARY



Brampton-Chinguacousy

water pollution control plant

1968

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ONTARIO WATER RESOURCES COMMISSION

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Brampton - Chinguacousy :
water pollution control plant.
81774

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

D Caverly

D. S. Caverly,
General Manager.

D McTavish

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

Environment Ontario
Laboratory Library
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ONTARIO WATER
RESOURCES COMMISSION

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Toronto 7

BRAMPTON-CHINGUACOUSY
water pollution control plant

operated for

THE TOWN OF BRAMPTON

and

THE TOWNSHIP OF CHINGUACOUSY

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

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FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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Title Page i
Foreword ii
'68 Review 1
Project Costs 2
Operating Costs 3
Process Data 5
Conclusions . . . . Inside back cover

'68 REVIEW

This plant, with a design capacity of five million gallons per day, operated with good efficiency.

The total flow treated during 1968 was 1319.7 million gallons. Cost of treatment was $99.35 per million gallons.

The average strength of the raw sewage was 171 mg/l BOD and 241 mg/l suspended solids.

The plant was well maintained by the staff, consisting of a superintendent, assistant superintendent, mechanic, mechanic's assistant, four operators and one labourer.

PROJECT COSTS

NET CAPITAL COST (Estimated):	
Brampton	$106,588.55
Chinguacousy	871,385.58
Long Term Debt to OWRC	$977,974.13

Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968:	
Brampton	$210,761.00
Chinguacousy	13,129.69
	$223,890.69

The cost to the municipalities during 1968 was as follows:

Net Operating		
Brampton	$78,665.87	
Chinguacousy	61,441.35	$140,107.22
Debt Retirement		
Brampton	$17,585.00	
Chinguacousy	2,151.00	19,736.00
Reserve		
Brampton	$ 3,747.75	
Chinguacousy	2,376.19	6,123.94
Interest Charged		
Brampton	$48,906.97	
Chinguacousy	5,983.01	54,889.98
TOTAL		$220,857.14

RESERVE ACCOUNT

Balance @ January 1, 1968:		
Brampton	$46,479.42	
Chinguacousy	21,580.41	$68,059.83
Deposited by Municipalities		
Brampton	$ 3,747.75	
Chinguacousy	2,376.19	6,123.94
Interest Earned		
Brampton	$ 2,831.19	
Chinguacousy	1,329.39	4,160.58
		$78,344.35
Less Expenditures		-
Balance @ December 31, 1968		$78,344.35

TOTALS FOR EACH MUNICIPALITY

Total Cost:	
Brampton	$148,905.59
Chinguacousy	71,951.55
	$220.857.14

Monthly Operating Costs

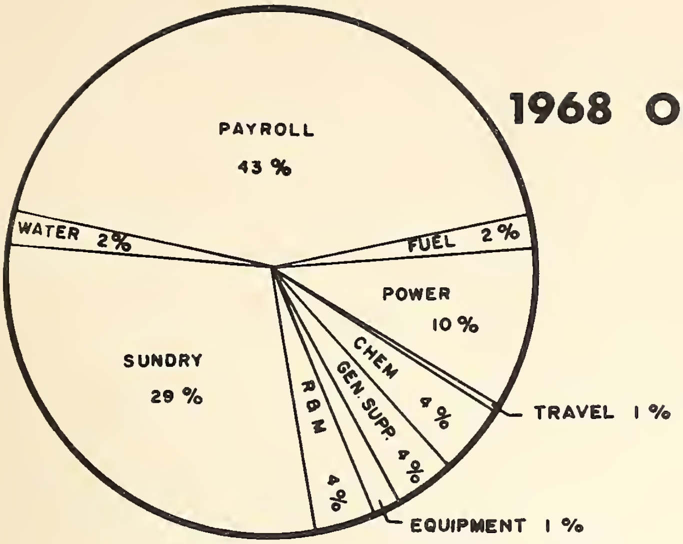
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAY ROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	4987. 51	3345. 21	306. 05	61. 84	1081. 13	-	120. 53	-	-	72. 75	-	-
FEB	11736. 61	3392. 69	401. 00	744. 42	995. 19	1109. 85	184. 42	-	235. 38	3581. 69	1091. 97	-
MAR	11731. 04	5592. 53	632. 43	23. 90	990. 63	1198. 05	(39. 45)	270. 38	93. 43	2830. 93	78. 57	59. 64
APRIL	8702. 40	3684. 24	331. 24	505. 63	882. 06	-	118. 69	172. 00	166. 93	2423. 50	34. 73	383. 38
MAY	9479. 50	3456. 00	488. 09	-	1094. 75	(158. 55)	592. 70	22. 30	55. 69	3840. 88	38. 20	49. 44
JUNE	11991. 73	3482. 48	440. 25	476. 06	986. 17	1198. 05	511. 38	966. 00	1047. 46	2487. 01	396. 87	-
JULY	12859. 94	3412. 50	797. 38	-	1081. 46	-	374. 46	-	488. 85	6643. 64	24. 05	37. 60
AUG	8181. 97	5600. 18	475. 17	-	1172. 46	-	775. 25	-	139. 74	(. 85)	-	20. 02
SEPT	11020. 52	4124. 58	276. 06	-	1153. 43	171. 15	427. 73	-	1655. 82	3122. 30	23. 15	66. 30
OCT	10334. 43	3545. 40	-	16. 90	-	50. 06	373. 03	11. 32	567. 99	5735. 00	34. 73	-
NOV	11199. 04	3697. 89	-	-	2243. 72	2224. 95	502. 37	-	299. 31	1573. 01	585. 14	72. 65
DEC	18885. 09	9425. 32	-	854. 28	1209. 75	158. 42	680. 68	39. 50	495. 58	5834. 97	110. 36	76. 23
TOTAL	131109. 78	52759. 02	4147. 67	2683. 03	12890. 75	5951. 98	4621. 79	1481. 50	5246. 18	38144. 83	2417. 77	765. 26

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $30, 542. 25

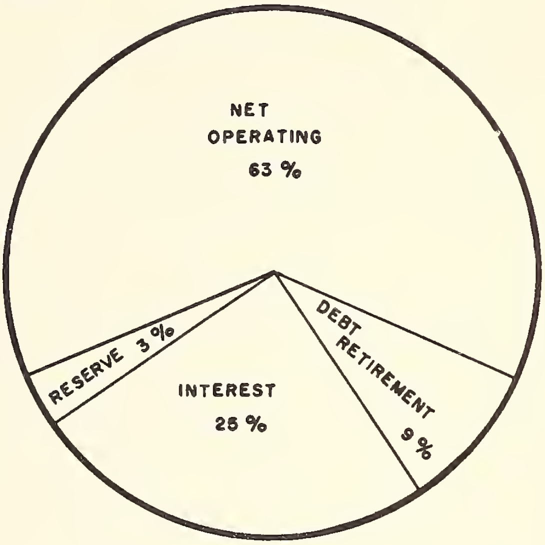
BRACKETS INDICATE CREDIT

Does not include $8, 997. 44 on Bramalea P. S.

1968 OPERATING COSTS



TOTAL ANNUAL COST



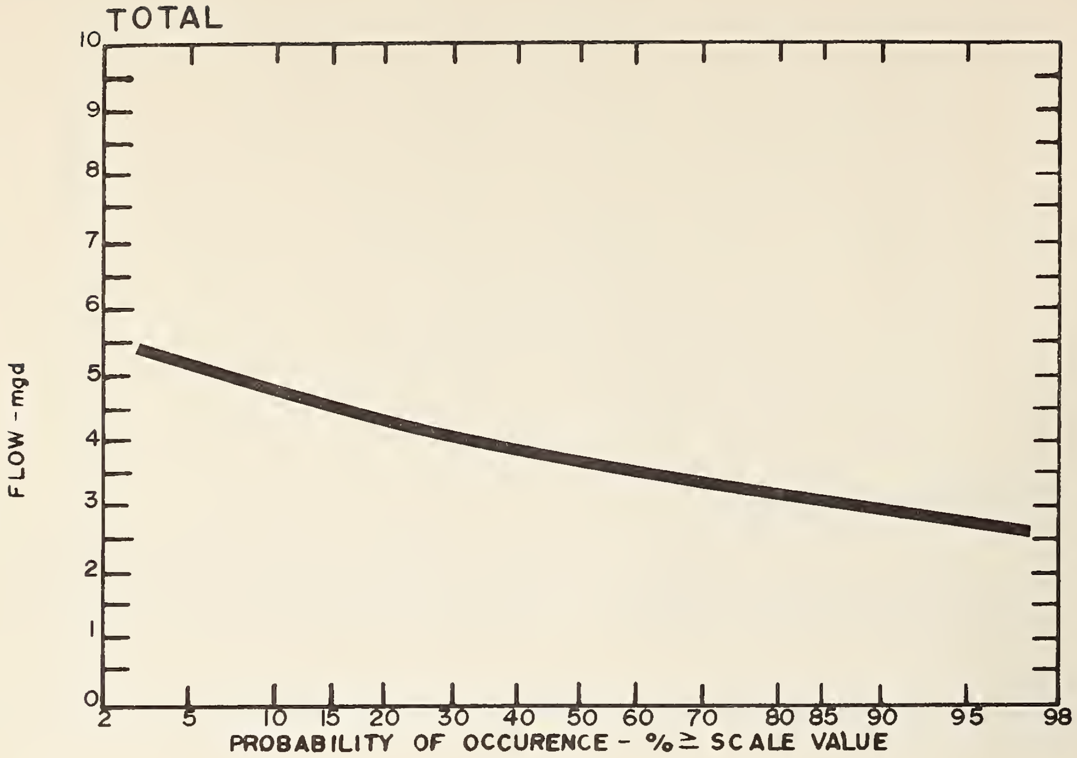
Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	810.5	$ 41,489.00	$51.19	1 cent
1965	956.1	55,678.76	66.27	2 cents
1966	956.6	75,514.00	78.94	2 cents
1967	1388.7	98,637.30	71.03	5 cents
1968	1319.7	131,109.78	99.35	6 cents

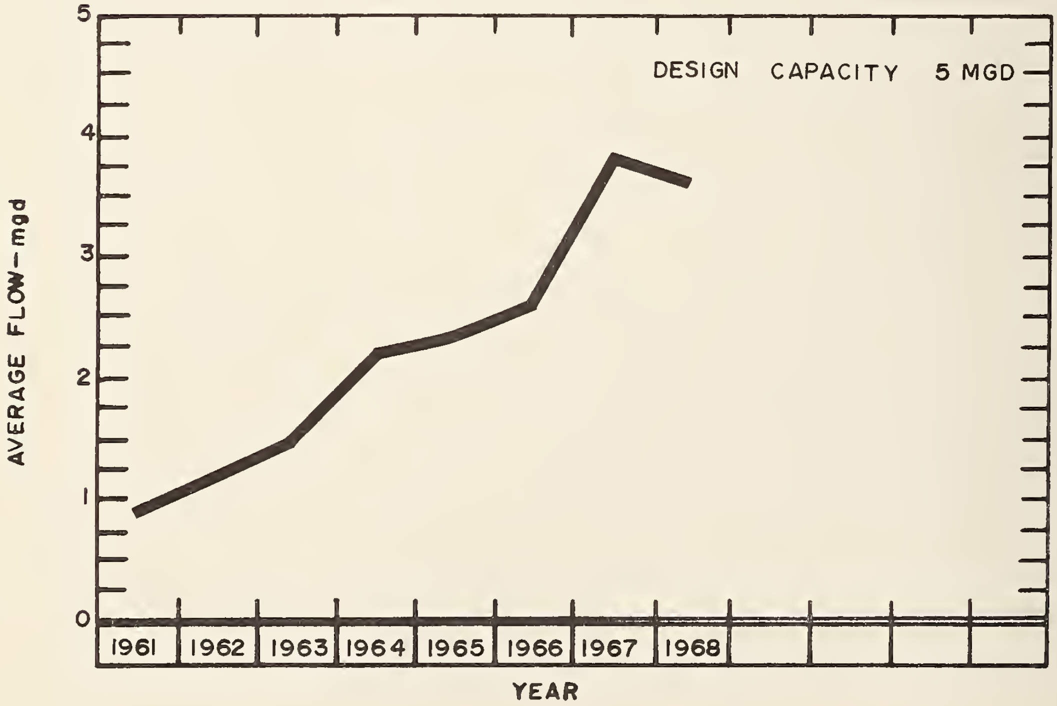
Process Data

The maximum 24-hour flow recorded in 1968 was 6.30 million gallons. This occurred during February. The daily average flow for the year was 3.60 mgd.

The probability of daily flow shows that the plant capacity was exceeded 7% of the time.


TOTAL
FLOW - mgd
0
1
2
3
4
5
6
7
8
9
10
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

FLOWS


AVERAGE FLOW - mgd
DESIGN CAPACITY 5 MGD
0
1
2
3
4
5
1961
1962
1963
1964
1965
1966
1967
1968
YEAR

PLANT FLOWS and CHLORINATION

TOTAL

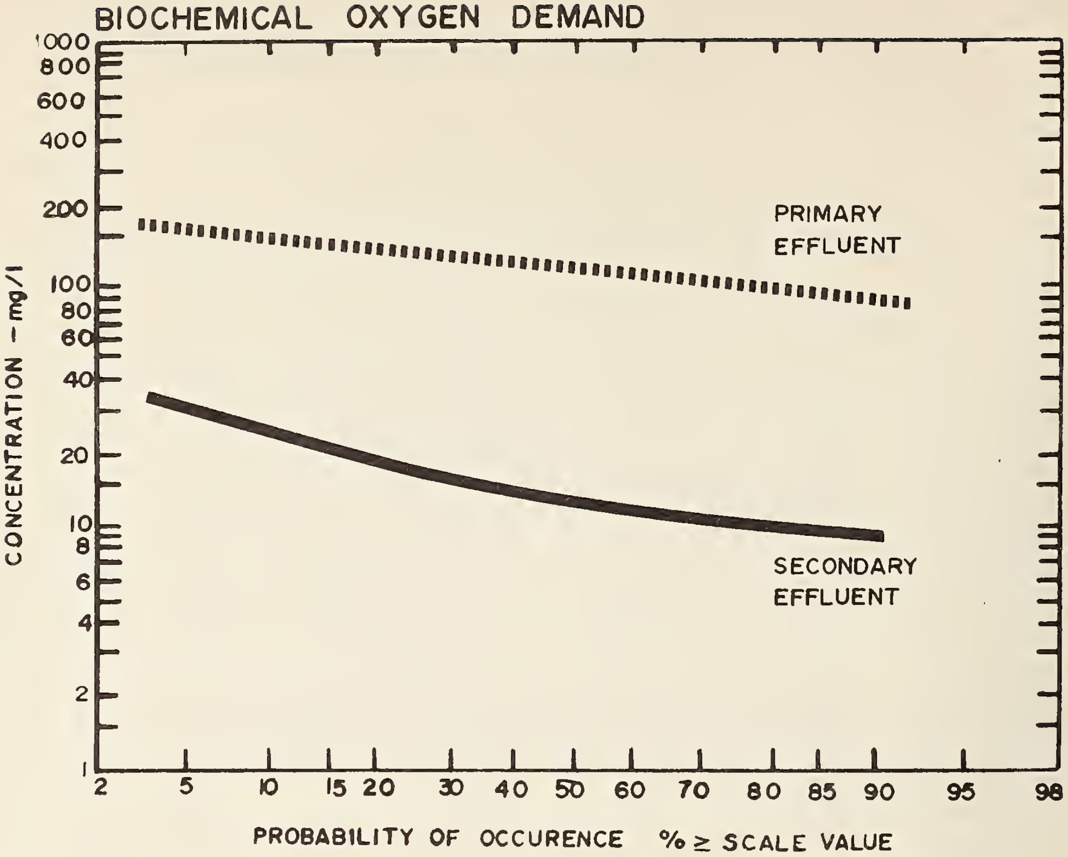
MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10^3 lbs.	DOSAGE mg/l
JAN	102.0	3.29	5.69	2.46	5.35	5.3
FEB	111.0	3.83	6.30	2.72	5.06	4.6
MAR	121.6	3.92	5.45	2.20	6.14	5.0
APR	94.3	3.14	4.12	2.13	5.55	5.9
MAY	111.0	3.55	4.75	2.06	5.43	4.9
JUN	104.4	3.48	5.38	2.31	5.86	5.6
JUL	99.7	3.22	4.93	2.17	6.18	6.2
AUG	108.4	3.50	4.18	2.10	6.22	5.7
SEPT	117.8	3.93	5.74	2.13	5.33	4.5
OCT	115.6	3.73	5.06	2.26	5.27	4.5
NOV	112.1	3.74	5.36	2.64	4.82	4.2
DEC	121.8	3.93	5.58	2.64	5.10	4.2
TOTAL	1319.7	-	-	-	66.31	-
AVERAGE	-	3.60	-	-	5.53	5.0

COMMENTS

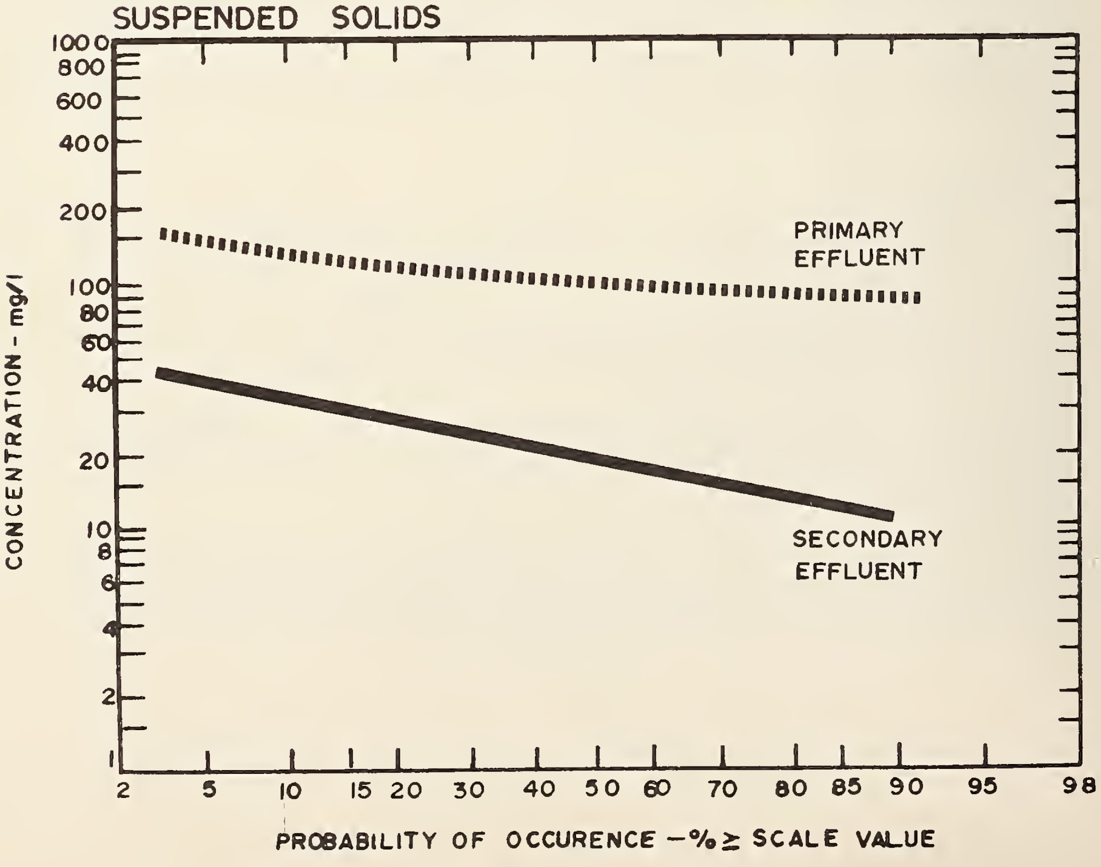
The maximum 24-hour flow of 6.30 million gallons occurred in February. The average daily flow for the year was 3.60 mgd.

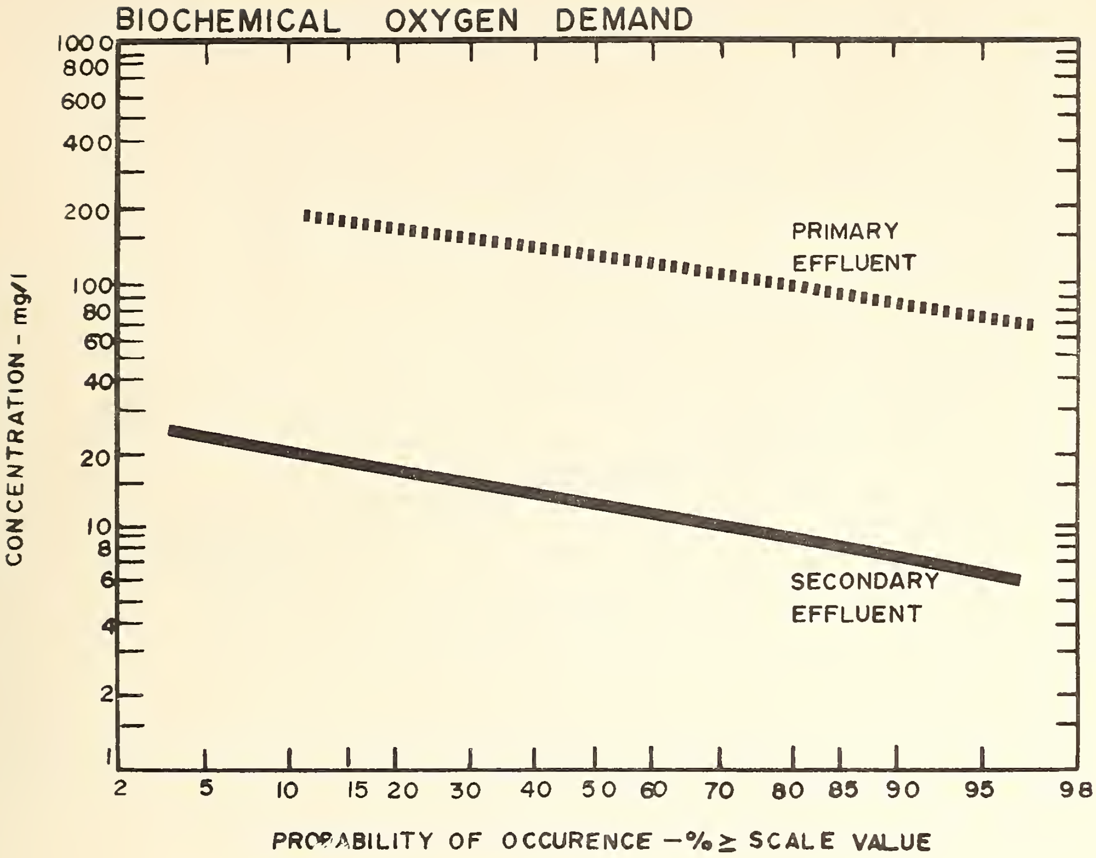
The graph indicating the probability of daily flows shows that the plant capacity was exceeded 7% of the time.

Year round chlorination is practised at this plant. A total of 663,100 lbs. of chlorine was used during 1968 at an average dosage of 5.0 mg/l.

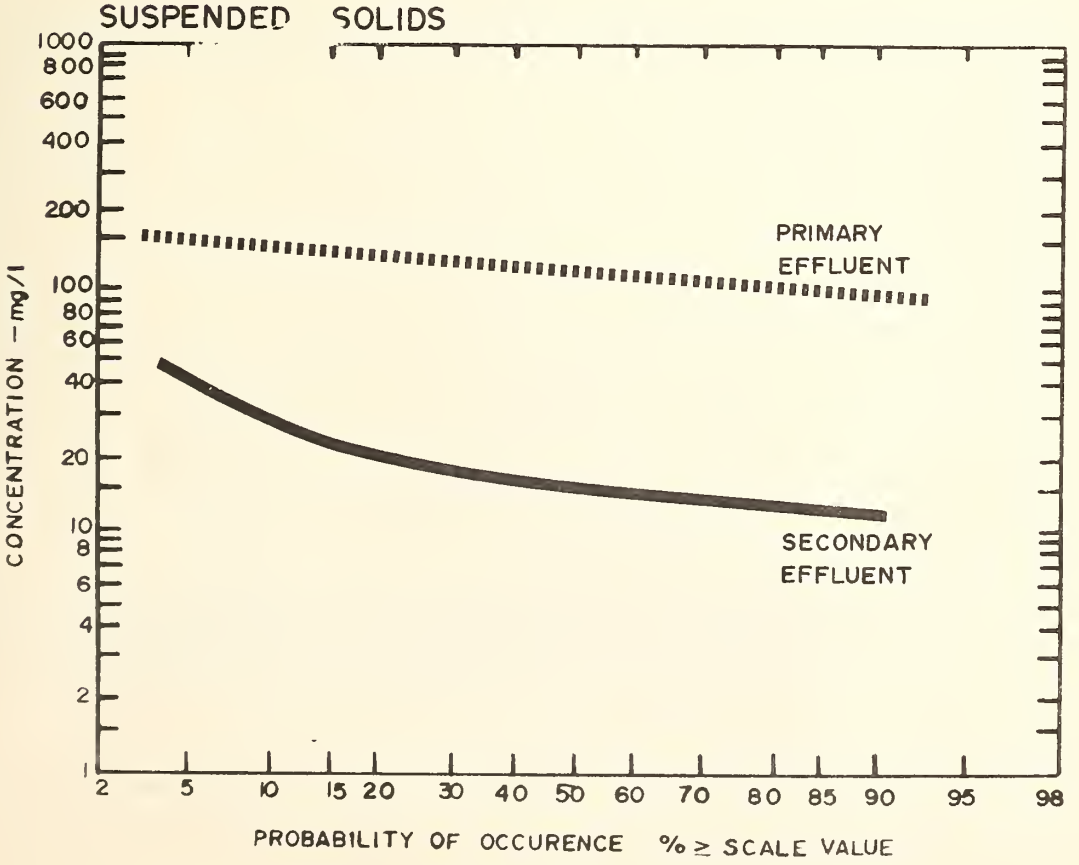

BIOCHEMICAL OXYGEN DEMAND
CONCENTRATION - mg/l
1000
800
600
400
200
100
80
60
40
20
10
8
6
4
2
1
PRIMARY EFFLUENT
SECONDARY EFFLUENT
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE %≥ SCALE VALUE

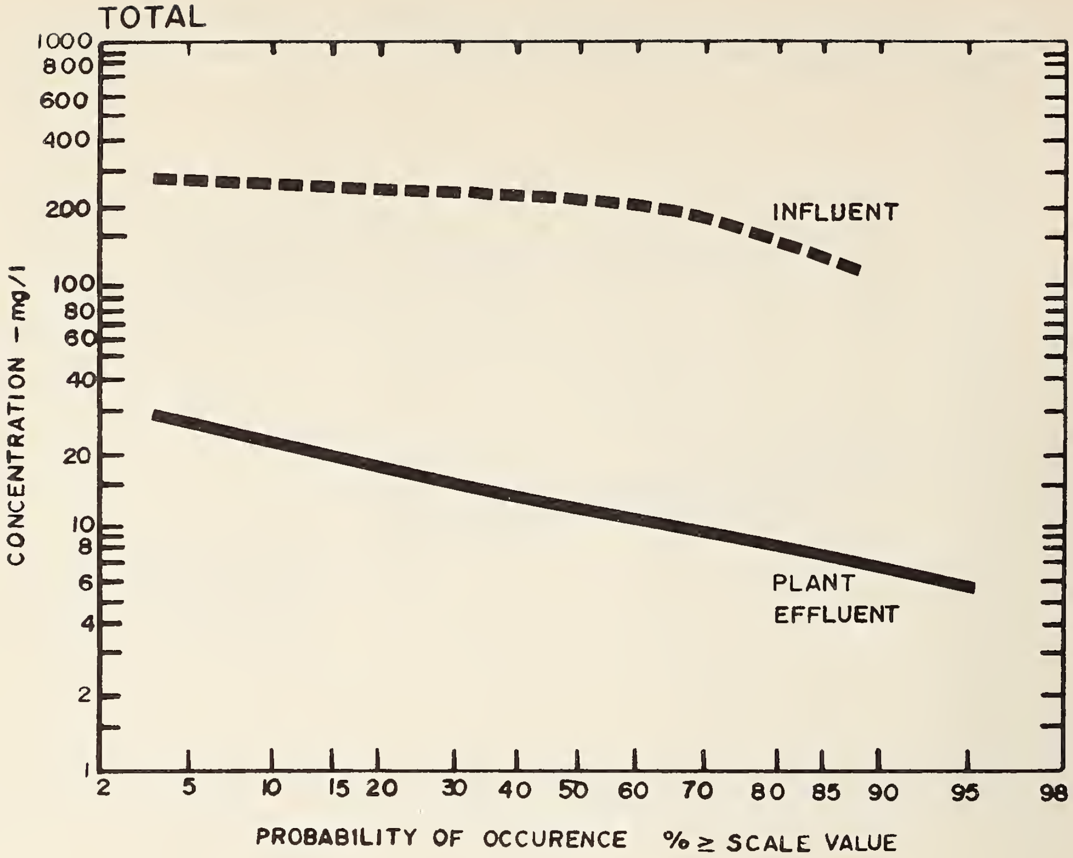
PLANT A


SUSPENDED SOLIDS
CONCENTRATION - mg/l
1000
800
600
400
200
100
80
60
40
20
10
8
6
4
2
1
PRIMARY EFFLUENT
SECONDARY EFFLUENT
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE —%≥ SCALE VALUE

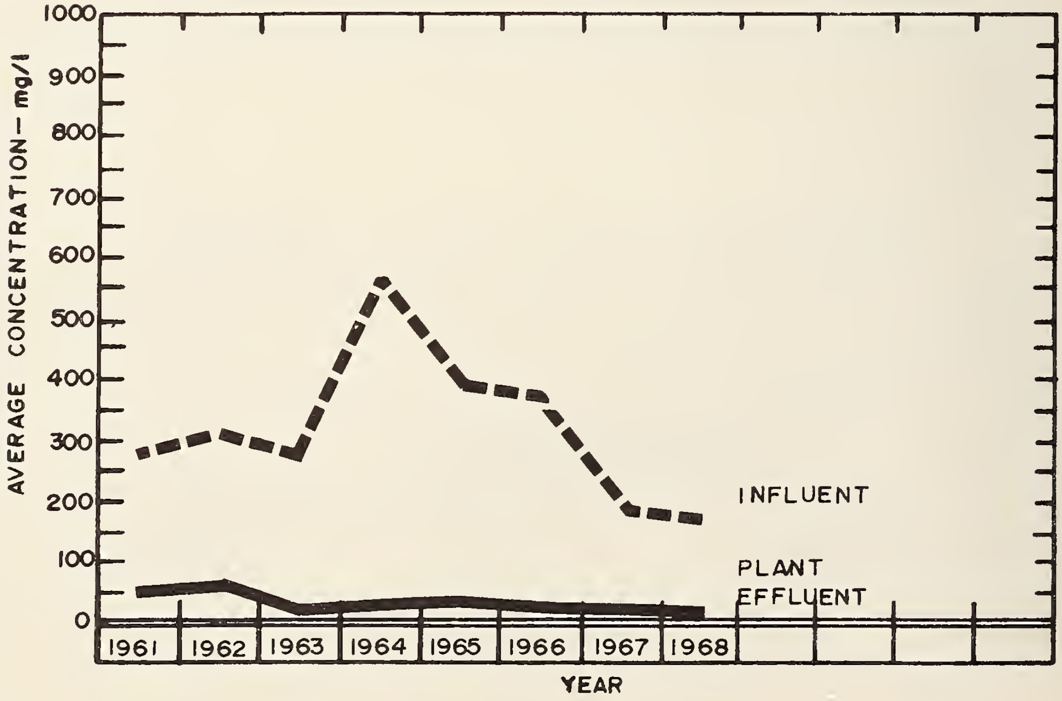

BIOCHEMICAL OXYGEN DEMAND
1000
800
600
400
200
100
80
60
40
20
10
8
6
4
2
1
CONCENTRATION - mg/l
PRIMARY EFFLUENT
SECONDARY EFFLUENT
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE –% ≥ SCALE VALUE

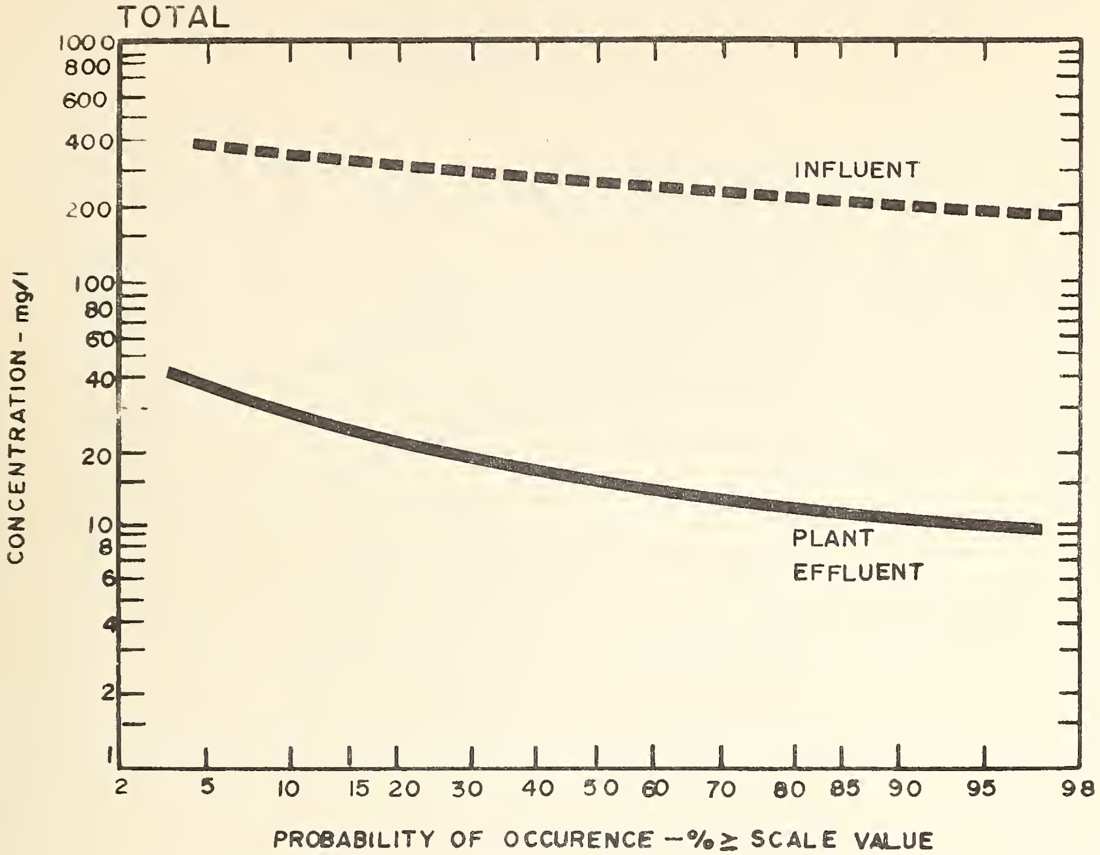
PLANT B


SUSPENDED SOLIDS
1000
800
600
400
200
100
80
60
40
20
10
8
6
4
2
1
CONCENTRATION – mg/l
PRIMARY EFFLUENT
SECONDARY EFFLUENT
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE % ≥ SCALE VALUE

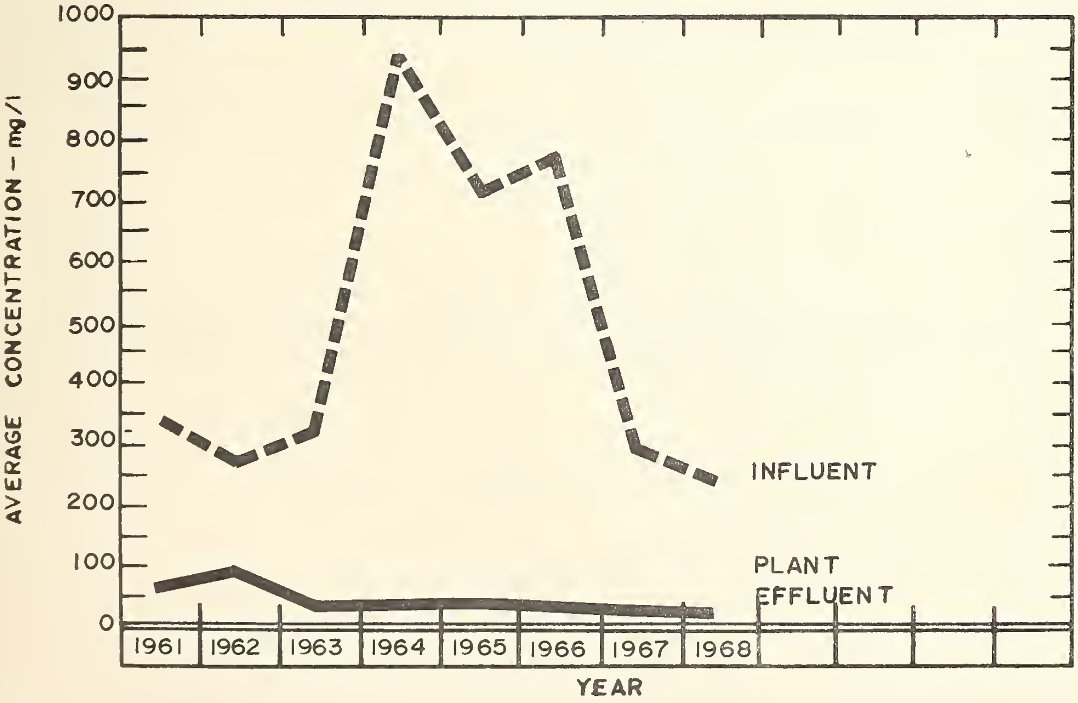


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

PLANT A

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	REMOVAL ft^3
JAN	175	15	91	58.7	232	36	84	71.9	
FEB	153	13	92	69.4	187	28	85	78.8	
MAR	180	15	92	67.6	258	24	91	95.8	
APR	197	8	96	50.7	198	14	93	49.3	
MAY	160	18	89	54.7	324	15	95	119.0	
JUN	130	9	93	46.5	258	7	97	96.5	
JULY	210	17	92	70.6	192	10	95	66.6	
AUG	125	14	89	42.7	254	20	92	90.1	
SEPT	233	7	97	99.6	414	15	96	175.8	
OCT	178	8	96	88.9	213	7	97	107.7	
NOV	130	15	88	54.2	136	9	93	59.9	
DEC	175	20	89	77.6	220	20	91	98.8	
TOTAL	-	-	-	781.2	-	-	-	1110.2	
AVERAGE	171	13	92	65.1	241	17	93	92.5	

COMMENTS

The percent removals of BOD and suspended solids were 92% and 93% respectively. The removal in this plant was slightly lower than the three mgd plant.

PLANT EFFICIENCY

PLANT B

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^{4} lb	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^{4} lb	REMOVAL ft^{3}
JAN	175	7	96	11.0	232	12	95	14.4	
FEB	153	9	94	8.8	187	17	91	10.4	
MAR	180	24	87	12.6	258	27	90	18.6	
APR	197	10	95	12.6	198	17	91	12.2	
MAY	160	11	93	10.7	324	12	96	22.3	
JUN	130	10	92	7.9	258	8	97	16.5	
JULY	210	13	94	12.4	192	14	93	11.2	
AUG	125	9	93	8.1	254	9	96	17.1	
SEPT	233	5	98	16.8	414	7	98	30.0	
OCT	178	10	94	10.6	213	12	94	12.7	
NOV	130	8	94	8.1	136	10	93	8.3	
DEC	175	5	97	12.3	220	10	95	15.2	
TOTAL	–	–	–	131.9	–	–	–	188.9	
AVERAGE	171	10	94	11.0	241	13	95	15.7	

COMMENTS

The percent removals of BOD and suspended solids were 94% and 95% respectively. The removal in this plant was slightly higher than the two mgd plant.

PLANT EFFICIENCY

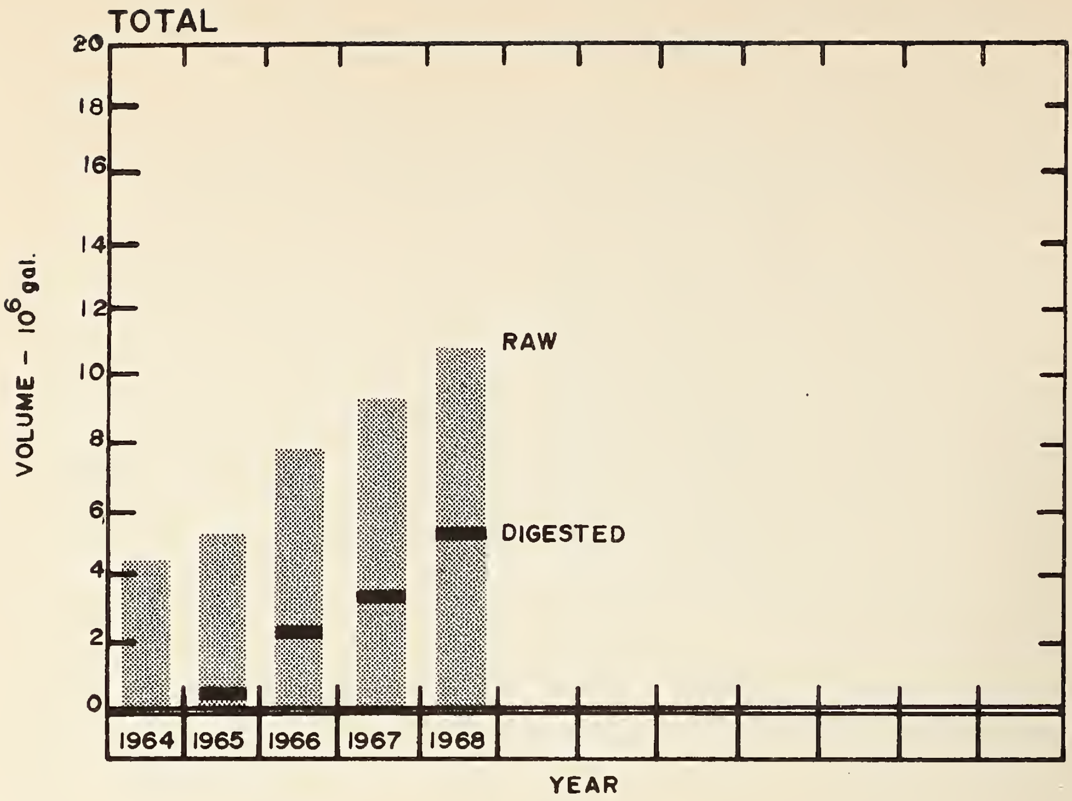
TOTAL

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^{4} lb	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^{4} lb	REMOVAL ft^{3}
JAN	175	10	94	16.8	232	22	91	21.4	351
FEB	153	11	93	15.8	187	23	88	18.2	533
MAR	180	21	88	19.3	258	26	90	28.2	620
APR	197	9	96	17.7	198	15	92	17.2	432
MAY	160	11	93	16.5	324	13	96	34.6	707
JUN	130	10	93	12.5	258	7	97	26.1	459
JULY	210	13	94	19.6	192	12	94	17.9	405
AUG	125	11	91	12.4	254	13	95	26.2	378
SEPT	233	6	98	20.6	414	11	97	48.6	297
OCT	178	8	95	19.6	213	53	75	18.5	378
NOV	130	10	92	13.4	136	10	92	13.4	404
DEC	175	13	93	19.7	220	15	93	25.0	404
TOTAL	-	-	-	203.9	-	-	-	295.3	5368
AVERAGE	171	11	94	16.9	241	18	93	24.6	448

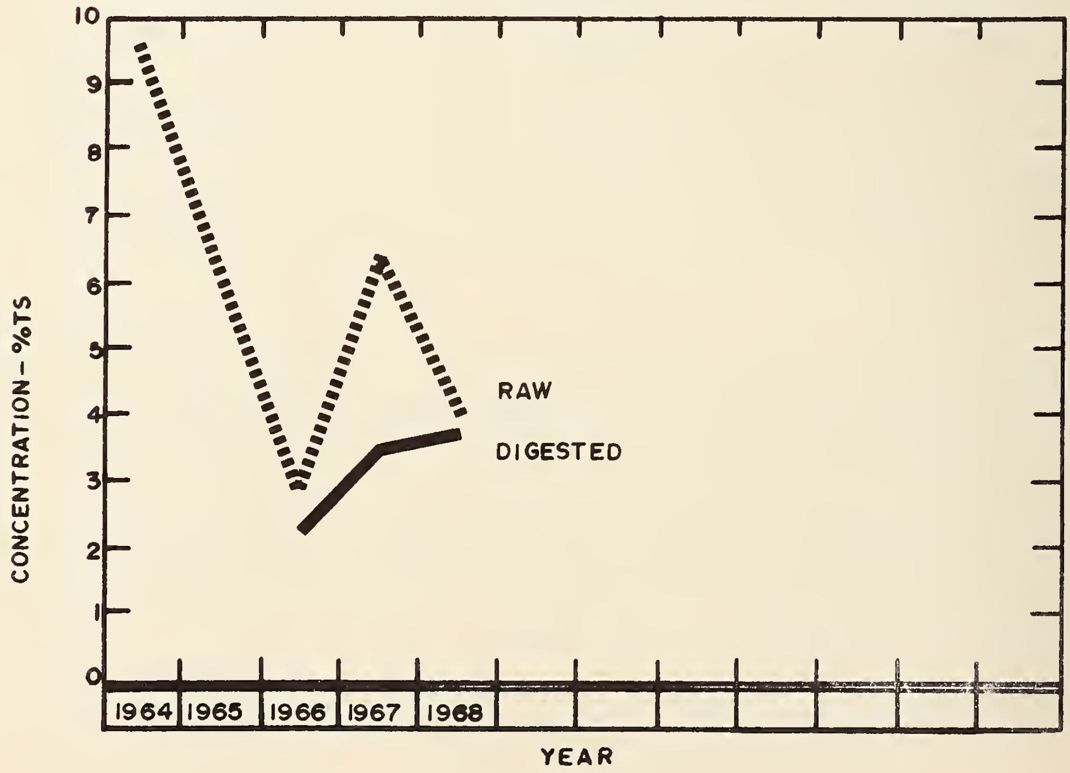
COMMENTS

An average loading of 171 mg/l BOD and 241 mg/l suspended solids occurred in 1968. The plant efficiency of 94% BOD removal and 93% suspended solids removal indicates that the plant was working well.

The effluent BOD was below the Commission's objective of 15 mg/l. However, the effluent suspended solids was slightly above. The grit removed was 5368 cu. ft., an average of 2.5 cu. ft. per million gallons.


TOTAL
VOLUME - 10^6 gal.
20
18
16
14
12
10
8
6
4
2
0
RAW
DIGESTED
1964
1965
1966
1967
1968
YEAR

DIGESTION


CONCENTRATION - %TS
10
9
8
7
6
5
4
3
2
1
0
RAW
DIGESTED
1964
1965
1966
1967
1968
YEAR

SLUDGE DIGESTION and DISPOSAL

TOTAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^5 gal	T.S. %	V.S. %	VOLUME 10^5 gal	T.S. %	V.S. %	VOLUME 10^5 gal	T.S. %	LIQUID 10^3 yd^3	DEWATERED yd^3
JAN	8.63	6.0	69	3.79	6.3	53	-	-	2.10	31
FEB	7.63	5.1	65	4.11	4.5	80	-	.2	2.44	0
MAR	9.14	2.5	69	4.08	4.0	54	-	.2	2.42	0
APR	8.40	2.7	74	2.06	3.2	55	-	.3	1.22	0
MAY	8.89	3.0	76	3.12	2.9	60	-	.4	1.85	0
JUN	8.26	4.5	78	4.86	4.2	56	-	.2	2.88	0
JUL	8.56	3.5	75	5.11	5.9	43	3.94	.3	3.03	0
AUG	8.49	4.2	67	5.08	3.0	37	3.40	.3	3.01	0
SEPT	8.37	3.7	74	4.57	3.9	42	3.80	.3	2.71	0
OCT	9.09	3.9	80	5.43	3.7	54	3.52	.7	3.22	0
NOV	9.52	4.4	65	4.86	1.7	56	-	-	2.88	0
DEC	12.47	4.5	72	5.65	1.4	51	7.00	.3	3.35	0
TOTAL	107.45	-	-	52.72	-	-	-	-	31.11	31
AVERAGE	8.95	4.0	72	4.39	3.7	53	4.33	.3	2.59	-

COMMENTS

The volume of sludge pumped to the digester was 10,745,000 gallons, while the volume removed after digestion was 5,246,636 gallons.

Liquid sludge haulage was preferred to dewatered sludge haulage because it was found that liquid sludge was cheaper to dispose of.

AERATION

PLANT A

MONTH	AVERAGE FLOW mgd	PRIMARY EFF		SECONDARY EFF		ML SS CONC^{N} mg/l	F/M (lb BOD / lb MLSS)	AIR USED (1000 ft / lb BOD REMOVED)	WASTE SLUDGE lb
		BOD CONC^{N} mg/l	SS CONC^{N} mg/l	BOD CONC^{N} mg/l	SS CONC^{N} mg/l				
JAN	1.18	120	91	15	36	730	.34	1.97	-
FEB	1.71	116	97	13	28	1080	.32	1.39	-
MAR	1.32	114	123	15	24	1280	.21	1.87	-
APRIL	.89	117	93	8	14	1240	.15	2.50	-
MAY	1.24	127	106	18	15	1130	.25	1.81	-
JUN	1.28	93	103	9	7	1280	.16	2.27	-
JUL	1.18	125	106	17	10	1490	.17	1.92	-
AUG	1.24	95	75	14	20	910	.23	2.44	-
SEPT	1.47	106	104	7	15	900	.30	1.68	-
OCT	1.69	111	83	8	7	850	.39	1.41	-
NOV	1.52	98	98	15	9	700	.38	1.94	-
DEC	1.59	130	110	20	20	830	.44	1.40	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	1.36	113	99	13	17	1040	.28	1.88	-

COMMENTS

The average flow of 1.36 mgd was lower than the design flow of two mgd.

The secondary effluent BOD was below the Commission's objective of 15 mg/l. However, the suspended solids reading was slightly higher.

AERATION

PLANT B

		PRIMARY EFF		SECONDARY EFF					
MONTH	AVERAGE FLOW mgd	BOD $\mathrm{CONC^N}$ mg/l	SS $\mathrm{CONC^N}$ mg/l	BOD $\mathrm{CONC^N}$ mg/l	SS $\mathrm{CONC^N}$ mg/l	MLSS $\mathrm{CONC^N}$ mg/l	F/M (lb BOD / lb MLSS)	AIR USED (1000 ft / lb BOD REMOVED)	WASTE SLUDGE lb
JAN	2.11	98	102	7	12	1590	.12	-	-
FEB	2.12	97	90	9	17	2200	.09	-	-
MAR	2.60	136	116	24	27	1840	.19	-	-
APRIL	2.25	153	126	10	17	1740	.20	-	-
MAY	2.31	100	113	11	12	2140	.11	-	-
JUN	2.20	95	111	10	8	2000	.11	-	-
JUL	2.03	137	112	13	14	1890	.15	-	-
AUG	2.26	108	95	9	9	1480	.14	-	-
SEPT	2.46	82	104	5	7	1650	.12	-	-
OCT	2.04	135	97	10	12	1550	.18	-	-
NOV	2.13	100	86	8	10	1450	.15	-	-
DEC	2.33	110	110	5	10	1240	.20	-	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	2.24	112	105	10	13	1730	.15	-	-

COMMENTS

The average flow of 2.24 mgd was lower than the design flow of 3.0 mgd.

The BOD and suspended solids in the secondary effluent were both below the Commission's objectives of 15 mg/l.

CONCLUSIONS

This plant operated efficiently throughout the year.

However, the plant is expected to reach its capacity in 1969. A reduction in effluent quality is then to be expected.

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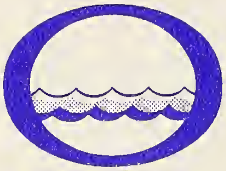

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